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(54) IMPROVEMENTS IN AND RELATING TO VEHICLE CONTROL ASSEMBLIES

(71) We, UOP INC, formerly Universal Oil Products Company, a Corporation organized and existing under the laws of the State of Delaware, United States of America, of Ten UOP Plaza, Algonquin & Mt. Prospect Roads, Des Plaines, Illinois 60016, United States of America, do hereby declare the invention,

for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to vehicle control assemblies and in particular to the mounting of the drivers seat and the controls in a vehicle.

In our pending patent application No. 61960/70 Serial No. 1,372,700, there is described a vehicle control assembly comprising a seat mounted for upward and downward movement relative to a base part through a spring suspension, and a support rigidly connected to the seat and on which the vehicle controls are mounted so that the seat and the controls move together relative to the base part.

Such a vehicle control assembly was designed to be rigidly mounted on the floor of a cab of a vehicle so that although the driving seat and the controls were rigidly interconnected to avoid relative movement between the driver and the controls, the seat and the controls together were isolated at least in part from vibrations of the vehicle by means of the spring suspension.

The present invention is concerned with a further development of such a control assembly designed to reduce the effect on the driver of the pitch and roll of the vehicle.

According to the present invention there is provided a vehicle control assembly comprising a vehicle seat and control members interconnected for movement together and mounted on a base plate, and a suspension mounting said base plate above a support plate, said suspension comprising support means which support the base plate for pivotal movement relative to the support plate about mutually perpendicular axes, and biassing means which urge the base plate towards a neutral position relative to the support plate.

One embodiment of the invention is illustrated in the accompanying drawings in which:—

Figure 1 is a diagrammatic side view of a vehicle control assembly in accordance with the present invention;

Figure 2 is a perspective view of a stabiliser system including control struts and forming part of the assembly of Figure 1;

Figures 3 and 4 are sections on the lines III—III and IV—IV of Figure 2;

Figures 5 and 6 show two operative positions of one of the four control struts shown in Figure 2.

As shown in Figure 1, the vehicle control assembly comprises a seat 10 formed by a seat cushion 11 and squab 12 mounted on a rigid floor plate 13 which also carries a control assembly 14 comprising a steering column 15 supporting a steering wheel 16, and an instrument binnacle 17, the pedals (for example brake, accelerator and clutch not shown) being mounted in the floor plate.

The floor plate is supported above a base plate 18 by a spring suspension which, as shown in Figure 1 comprises two separate scissor-type linkage systems 20 one having a scissors axis extending laterally of the seat and the other having a scissors axis extending longitudinally of the seat. Such scissor-type linkages are biassed in an upward direction by springs (not shown), such for example as a torsion bar spring disposed on one of the pivotal axes, or alternatively coil springs can be fitted between the base plate and floor plate.

In order to reduce the pitch and roll of the seat and the controls, due to pitch and roll of the vehicle, the base plate 18 is mounted above a support plate 22 by means of two mutually perpendicular and interconnected tubular shafts 23, 24. The shafts are

preferably disposed longitudinally and laterally of the assembly, the base plate having fore and aft trunnions 25, 26 depending from the underside of the base plate and pivotally connected at their lower ends to the fore and aft ends of the longitudinal shaft 23, the opposite ends of the lateral shaft 24 being mounted in trunnions 27, 28 upstanding from the support plate. (It will be evident that as an alternative the trunnions of the longitudinal shaft could be mounted on the support plate if the trunnions of the lateral shaft are suspended from the base plate). The shafts are rigidly interconnected at their intersection where the half shafts fit into a central block 29.

The movement of the base plate 18 together with the parts which it carries, about the two shaft axes is opposed by four control struts 30 disposed adjacent the ends of the shafts and extending between the base plate and the support plate. Each control strut comprises a cylinder 31 which at one end is closed by a cap 32 which forms an end wall of the cylinder and is pivotally mounted on one of the plates and a rod 33 extending along the axis of the cylinder through an opening in the opposite end wall of the cylinder and having its outer end pivotally connected to the other of the plates. The inner end of the rod is slidably guided in a sleeve 34 extending from the cap for a distance along the axis of the cylinder. Disposed within the cylinder are two compression springs 35, 36 each resting at one end on an end wall of the cylinder and at its opposite end biassing a separate annular disc 37 towards an annular abutment 38 which is located at the mid-length position within the cylinder. The rod is formed with a collar 40 which, when the rod is in a neutral mid-position, is disposed within the central opening of the annular abutment and in this position the two discs 37 are held by their respective springs in engagement with the central abutment. If however a force is applied along the rod, the rod will move in the direction of the force picking up the disc located in front of it and will commence to load the spring which acts on this disc. On the other hand, movement of the rod in the opposite direction will relax this spring until the collar of the rod passes through the central abutment whereupon it will pick up the other disc and commence to load the other spring. The springs thus act to urge the rod towards a neutral position in which the base plate will be held parallel to the support plate. The two springs are fitted into the cylinder under preload to give a precise neutral position for the rod.

In addition, a torsion spring 41 formed by one or more torsion bars can be fitted into each tubular shaft. In one shaft the spring is secured at one end to one of the trunnions, and at its opposite end to the adjacent end of the shaft. In the other shaft, a separate half-length torsion bar can be fitted in each half shaft, one end of each bar being secured in a trunnion and the other end being secured in the central block 29. The torsion bars are unbiassed when the base plate 18 is parallel to the support plate 22, but tilting of the seat laterally or in the fore and aft mode will load the torsion bars in a sense to restore the parallelism between the base plate and support plate. The restoring force is applied by the torsion bars will complement that applied by the control struts.

WHAT WE CLAIM IS:—

1. A vehicle control assembly comprising a vehicle seat and control members interconnected for movement together and mounted on a base plate, and a suspension mounting said base plate above a support plate, said suspension comprising support means which support the base plate for pivotal movement relative to the support plate about mutually perpendicular axes, and biassing means which urge the base plate towards a neutral position relative to the support plate.

2. A vehicle control assembly according to claim 1 wherein the vehicle seat and control members are resiliently mounted on said base plate and guided for upward and downward movement relative thereto.

3. A vehicle control assembly according to claim 1 or claim 2 wherein the said support means comprise a fore and aft shaft and a lateral shaft supporting the base plate for movement about said mutually perpendicular axes, the two shafts being interconnected at a cross-over position, the opposite ends of one shaft being pivoted to the base plate and the opposite ends of the other shaft being pivoted to the support plate.

4. A vehicle control assembly according to claim 3 wherein at least one of the shafts is tubular, and the biassing means comprise a torsion bar extending along the, or each, said tubular shaft.

5. A vehicle control assembly according to any preceding claim wherein the biassing means comprise one or more control struts connected between the base plate and support plate, the, or each, control strut comprising a cylinder, a rod movable axially within the cylinder and two coil springs disposed within the cylinder on opposite axial sides of an abutment on the rod and biassing the abutment towards a central position in which the base plate assumes its neutral position relative to the support plate.

6. A vehicle control assembly substantially as herein described with reference to the accompanying drawings.

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1440686 COMPLETE SPECIFICATION
3 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

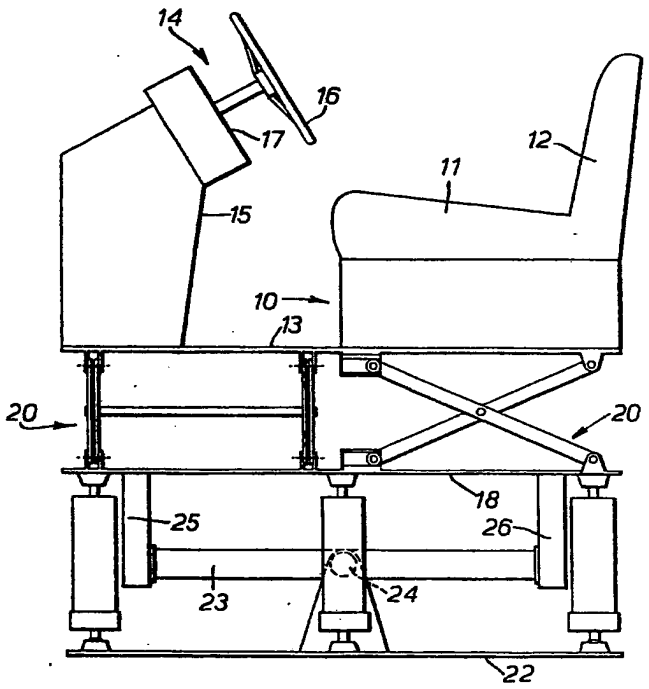

FIG. 1.

1440686 COMPLETE SPECIFICATION
3 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 2

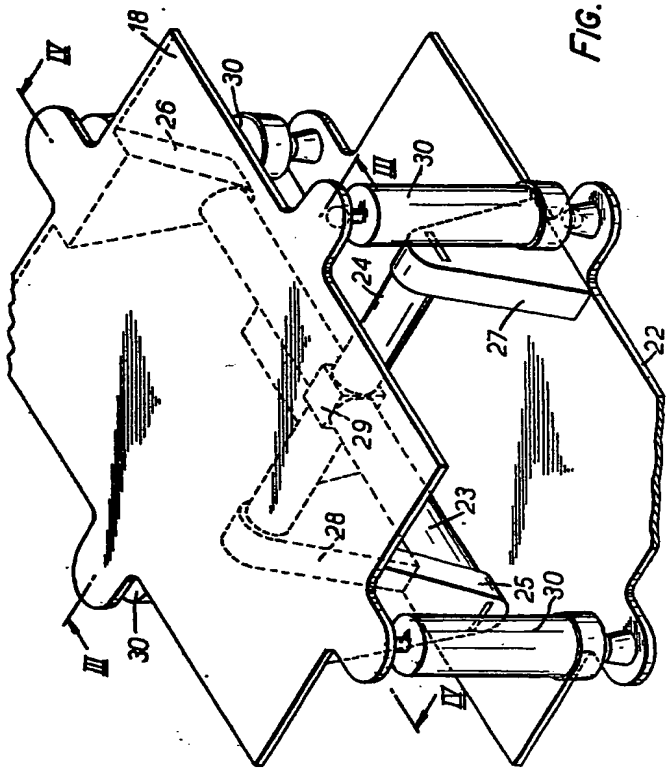

FIG. 2.

1440686 COMPLETE SPECIFICATION
3 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 3

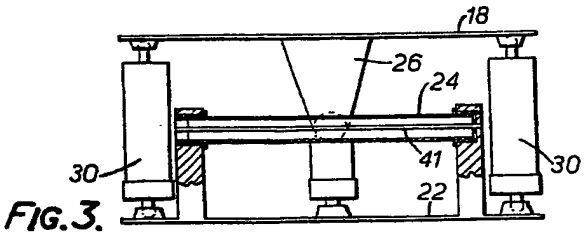

FIG.3.

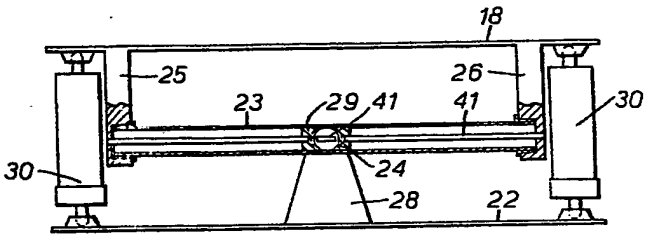

FIG.4.

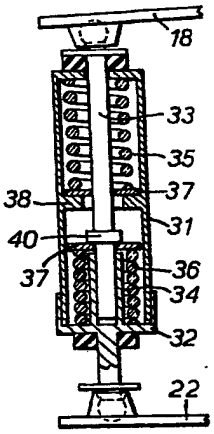

FIG.5.

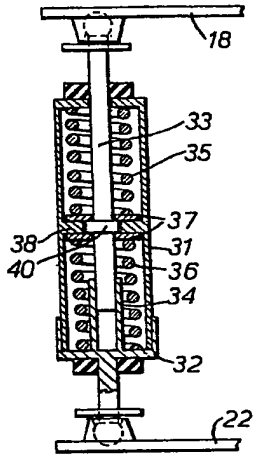

FIG.6.